

WHAT IS CLAIMED IS:

1. A rotary compressor for compressing a working fluid comprising:
a housing including an oil sump;
a stationary shaft extending into said housing and including a longitudinal passage,
said longitudinal passage having:
an oil inlet in fluid communication with said oil sump; and
a working fluid inlet configured to receive the working fluid;
a motor having a stator and a rotor, said rotor being rotatably mounted on said shaft
within said housing and including an internal compression chamber in fluid communication
with said longitudinal passage; and
a roller rotatably mounted on said shaft and eccentrically disposed within said
compression chamber, said roller being coupled to said rotor wherein rotation of said rotor
compresses the working fluid within said compression chamber.
2. The rotary compressor of claim 1 wherein said housing includes an interior
chamber, said oil sump being disposed in said interior chamber, working fluid compressed
within said compression chamber being discharged into said interior chamber wherein oil
from said oil sump enters said oil inlet and flow within said longitudinal passage in a
substantially upward direction due to a pressure differential created by said compressed
working fluid within said interior chamber.
3. The rotary compressor of claim 2 wherein said shaft includes at least one
substantially radially-oriented passage providing fluid communication between said
longitudinal passage and said compression chamber.
4. The rotary compressor of claim 3 wherein at least a portion of the oil and a
portion of the working fluid exits said longitudinal passage through a same said radially-
oriented passage.
5. The rotary compressor of claim 3 further comprising a bearing disposed
between said shaft and said roller, said at least one substantially radially-oriented passage
being positioned wherein oil from said longitudinal passage reaches said bearing.
6. The rotary compressor of claim 2 wherein said housing includes an outlet
communicating compressed working fluid from said interior chamber outwardly through said
housing.

7. The rotary compressor of claim 1 wherein said roller includes a channel providing fluid communication between said longitudinal passage and said compression chamber.
8. The rotary compressor of claim 1 wherein said rotor is integrally formed.
9. The rotary compressor of claim 1 wherein said rotor includes a radially outer surface having a plurality of permanent magnets mounted thereon.
10. The rotary compressor of claim 1 wherein said rotor includes a vane extending radially inwardly within said compression chamber and coupling said rotor to said roller.
11. The rotary compressor of claim 10 wherein said roller defines a recess having a bushing mounted therein, said bushing defining a radially extending slot, said vane being disposed within said slot wherein said slot and said vane are relatively slidable.
12. The rotary compressor of claim 10 wherein said roller and said vane divide said compression chamber into a variable-volume suction pocket and a variable-volume compression pocket, said rotor and said roller being configured to rotate and thereby compress working fluid in said compression pocket and draw working fluid into said suction pocket.
13. The rotary compressor of claim 1 further comprising first and second end plates disposed at opposite axial ends of said compression chamber, said shaft extending through at least one of said end plates.
14. The rotary compressor of claim 13 wherein said housing includes an interior chamber, said oil sump being disposed in said interior chamber, at least one of said end plates including a fluid passageway providing fluid communication between said compression chamber and said interior chamber.
15. The rotary compressor of claim 13 wherein said shaft extends through both said first end plate and said second end plate.
16. The rotary compressor of claim 1 further comprising at least one end plate disposed at an end of said compression chamber, said at least one end plate having a discharge valve cavity in fluid communication with said compression chamber, said at least one end plate including a discharge valve member disposed within said discharge valve cavity and controlling fluid flow from said compression chamber through said discharge valve cavity.
17. A rotary compressor for compressing a working fluid comprising:
a stationary shaft including a longitudinal passage having a lubricant inlet and a

working fluid inlet configured to receive the working fluid;

a motor having a stator and a rotor, said rotor being rotatably mounted on said shaft and including an internal compression chamber; and

a roller rotatably mounted on said shaft and within said compression chamber wherein said roller is rotatable about an axis spaced from a rotational axis of said rotor, said compression chamber being divided between said roller and said rotor into a variable-volume suction pocket and a variable-volume compression pocket, said compression pocket being at least periodically in fluid communication with a chamber containing a lubricant source wherein compressed working fluid is communicated to said chamber containing said lubricant source, said suction pocket being at least periodically in fluid communication with said longitudinal passage wherein working fluid is communicated from said longitudinal passage to said suction pocket, said roller being coupled to said rotor such that rotation of said rotor shrinks said compression pocket and expands said suction pocket, said expansion of said suction pocket operating to draw the working fluid through said longitudinal passage and into said suction pocket, said shrinkage of said compression pocket operating to compress the working fluid within said compression pocket and wherein lubricant from said lubricant source is forced through said lubricant inlet and into said longitudinal passage due to a pressure differential created by operation of said rotary compressor.

18. The rotary compressor of claim 17 wherein said shaft includes at least one substantially radially-oriented passage providing fluid communication between said longitudinal passage and said compression chamber.

19. The rotary compressor of claim 18 wherein at least a portion of the lubricant and a portion of the working fluid exits said longitudinal passage through a same said radially-oriented passage.

20. The rotary compressor of claim 19 further comprising a bearing disposed between said shaft and said roller, said at least one substantially radially-oriented passage being positioned wherein lubricant from said longitudinal passage reaches said bearing.

21. The rotary compressor of claim 17 wherein said roller includes a channel providing fluid communication between said longitudinal passage and said suction pocket.

22. The rotary compressor of claim 17 wherein said rotor is a non-laminated integrally formed part.

23. The rotary compressor of claim 17 wherein said rotor includes a radially outer surface having a plurality of permanent magnets mounted thereon.

24. The rotary compressor of claim 17 wherein said rotor includes a vane extending radially inwardly within said compression chamber and coupling said rotor to said roller.

25. The rotary compressor of claim 24 wherein said roller defines a recess having a bushing mounted therein, said bushing defining a radially extending slot, said vane being disposed within said slot wherein said slot and said vane are relatively slidable.

26. The rotary compressor of claim 17 further comprising first and second end plates disposed at opposite axial ends of said compression chamber, said shaft extending through at least one of said end plates.

27. The rotary compressor of claim 26 further comprising a housing including an interior chamber, said shaft and said motor being disposed in said interior chamber, said lubricant source comprising a lubricant sump disposed in said interior chamber.

28. The rotary compressor of claim 27 wherein said housing includes an outlet communicating compressed working fluid from said interior chamber outwardly through said housing.

29. The rotary compressor of claim 27 wherein at least one of said end plates includes a fluid passageway providing fluid communication between said compression pocket and said interior chamber.

30. The rotary compressor of claim 27 wherein said stationary shaft is integrally formed with a top portion of said housing.

31. The rotary compressor of claim 26 wherein said shaft extends through both said first end plate and said second end plate.

32. The rotary compressor of claim 17 further comprising at least one end plate disposed at an end of said compression chamber, said at least one end plate having a discharge valve cavity in fluid communication with said compression pocket, said at least one end plate including a discharge valve member disposed within said discharge valve cavity and controlling fluid flow from said compression pocket through said discharge valve cavity.

33. A rotary compressor for compressing a working fluid comprising:
a housing including an interior chamber and an oil sump disposed within said interior chamber;

a stationary shaft extending into said interior chamber and including a longitudinal passage, said longitudinal passage having an oil inlet in fluid communication with said oil sump and a working fluid inlet configured to receive the working fluid; and

a motor including a stator and a rotor, said rotor being rotatably mounted on said shaft within said interior chamber and having an internal compression chamber in at least periodic fluid communication with said longitudinal passage and in at least periodic fluid communication with said interior chamber, said rotor being configured to rotate and to thereby:

draw the working fluid from the longitudinal passage into said compression chamber;
and

increase pressure in said interior chamber such that oil from said oil sump enters said oil inlet and flows within said longitudinal passage in a substantially upward direction.

34. A rotary compressor assembly comprising:

a motor having a rotor defining a substantially cylindrical compression chamber having an axis;

a first plate and a second plate fixed relative to said rotor and defining opposite ends of said compression chamber;

stationary shaft extending axially through said compression chamber;

a roller rotatably mounted on said stationary shaft and disposed within said compression chamber;

a vane having an outer radial end fixed to said rotor and extending radially inwardly, said vane being fixed to said first and second plates proximate a radial inner end of said vane;
and

wherein said roller defines a slot, said radial inner end of said vane being disposed within said slot, rotation of said rotor rotating said first and second plates and said vane, rotation of said vane drivingly rotating said roller, said vane and said roller being relatively slidable.

35. The rotary compressor assembly of claim 34 further comprising a pin extending through said vane proximate said inner radial end of said vane, said pin at least partially engaging said first and second plates wherein said pin fixes said vane to said first and second plates.